

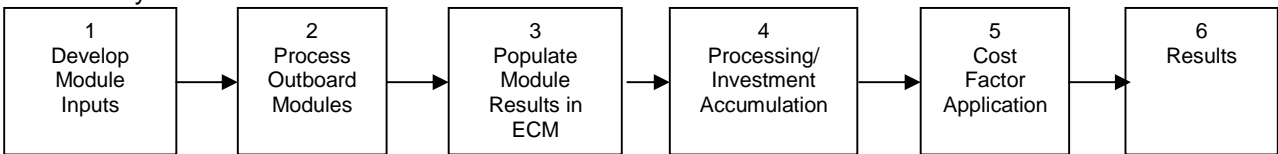
ECONOMIC COST MODEL METHODOLOGY

Introduction

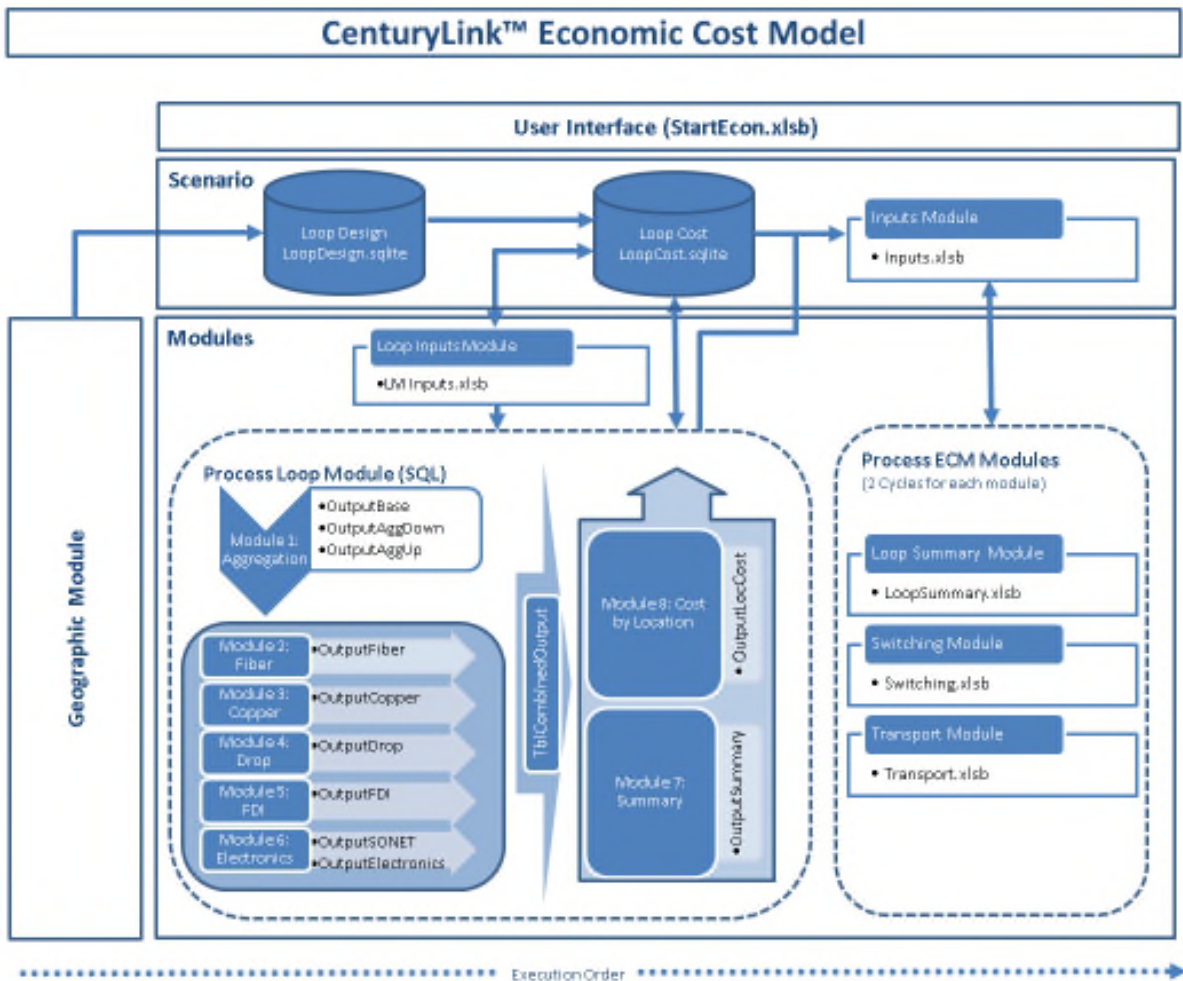
The CenturyLink Economic Cost Model (ECM) is the user interface that combines input files and investment calculation modules to derive economic investments for network elements and converts those investments to monthly recurring costs. The ECM allows users to create scenarios, enter inputs, process the models, save, and review results. For detailed operating instructions, see the Economic Cost Model User Manual, which provides step by step instructions for installation and processing.

The basic methodology of the ECM is as follows:

Cost Study Workflow



Detailed Module Flow



Considerations

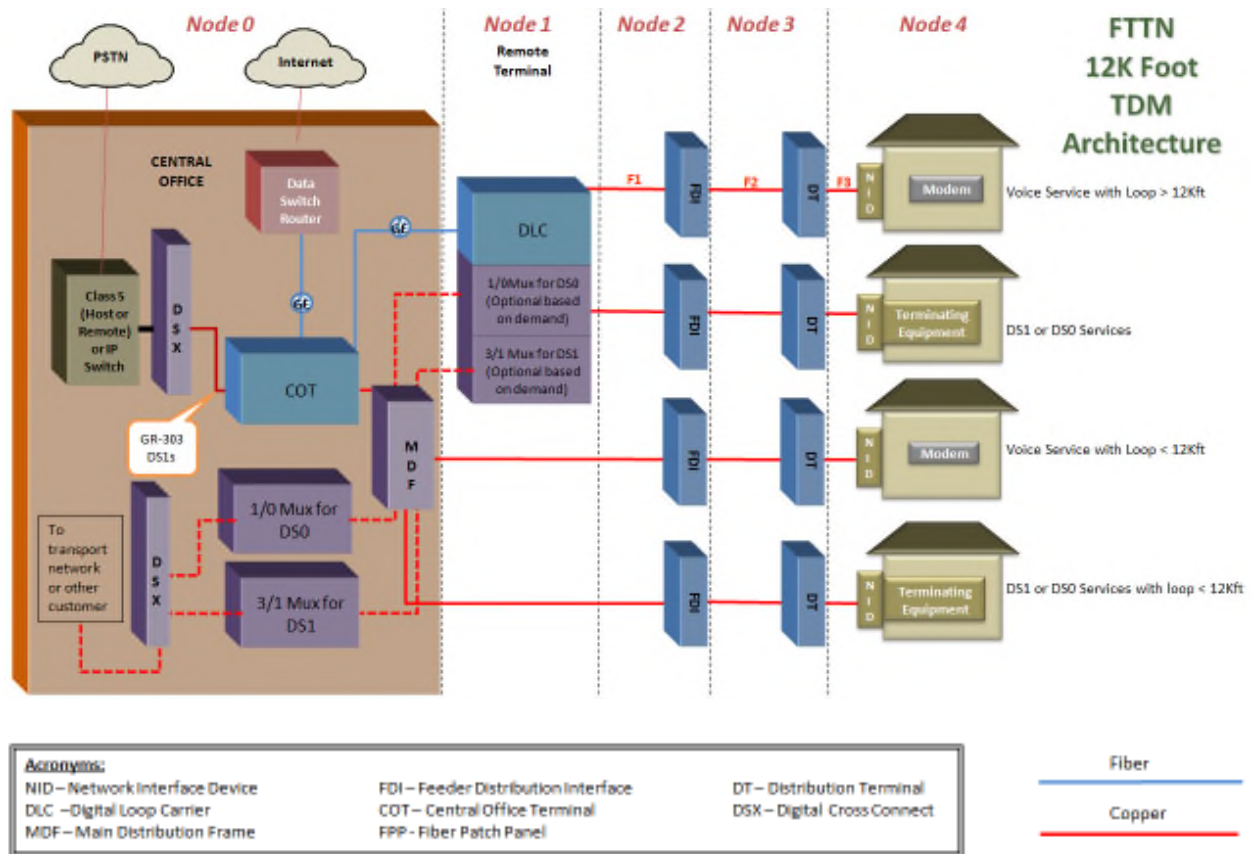
- * The Geographic Module is a standalone process that provides the network design used by the ECM model.
- * When the Loop Module is processing it stores and retrieves data from the LoopCost.sqlite
- * Changes made to parent processes will require reprocessing of child processes.
- * Files should be examined only using the StartEcon.xls user interface.

To calculate investments, each module replicates components of a forward looking telecommunications network. Each module applies engineering assumptions to build the network, applies the forward looking capital and labor inputs to determine quantities of materials, and then summarizes the investment requirements for cost calculations within ECM.

- The Geographic Module uses a combination of geocoded customer locations, Carrier Serving Area design assumptions, geographic data, and roads to optimally determine placement of customer serving terminals, sizing and placement of serving areas, and cable routes along roads to serve each customer location.
- The Loop Module uses the outputs of the Geographic Module to size the cabling and equipment to provide service to each customer location, determine units of materials needed, and applies the unit inputs to calculate investment between the serving central offices and customer serving terminal. Investments are calculated for each serving terminal and are typically summarized to the wire center or state levels.
- Depending on the study requirements, additional modules for other components of the network like transport, switching, or signaling may be used as necessary.
- The ECM pulls all of the investment modules results together to total investment for the forward looking network and calculate monthly recurring costs for various network elements. The element level costs may then be summarized for determining costs of service or for unbundled network elements.

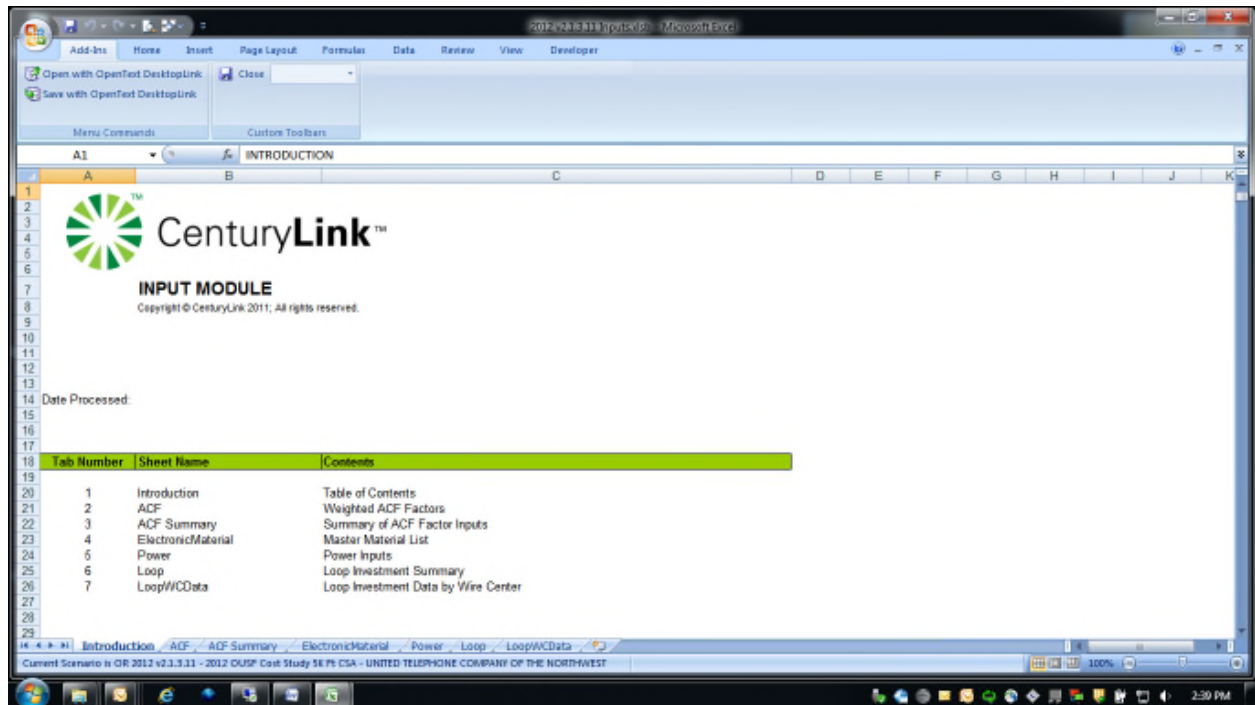
The general design of the forward looking network is as follows:

The Loop



Inputs

Inputs to the ECM include investment results from each of the modules required to develop costs.



Each module has its own process and methodology and may be processed stand alone or through the ECM interface. For example, the Loop Module (LM) includes geographic and investment modules. The investment module includes (among other inputs) cable, electronics, structure, plant mix and engineering inputs, and uses the combination of those inputs and results of the Geographic module to determine investment for the loop. Once the Loop Module completes processing, the investment results may be entered as inputs to the ECM. Likewise, investment results from each of the other modules are entered as inputs to the ECM.

Within the Input file to each ECM scenario, Inputs are in Blue colored font, calculated inputs are Brown, Green inputs may be found on another tab of the file, and Black figures are calculations.

Processing/Investment Accumulation

Once the results of the modules have been entered, the ECM may be processed. During processing, the following calculations occur

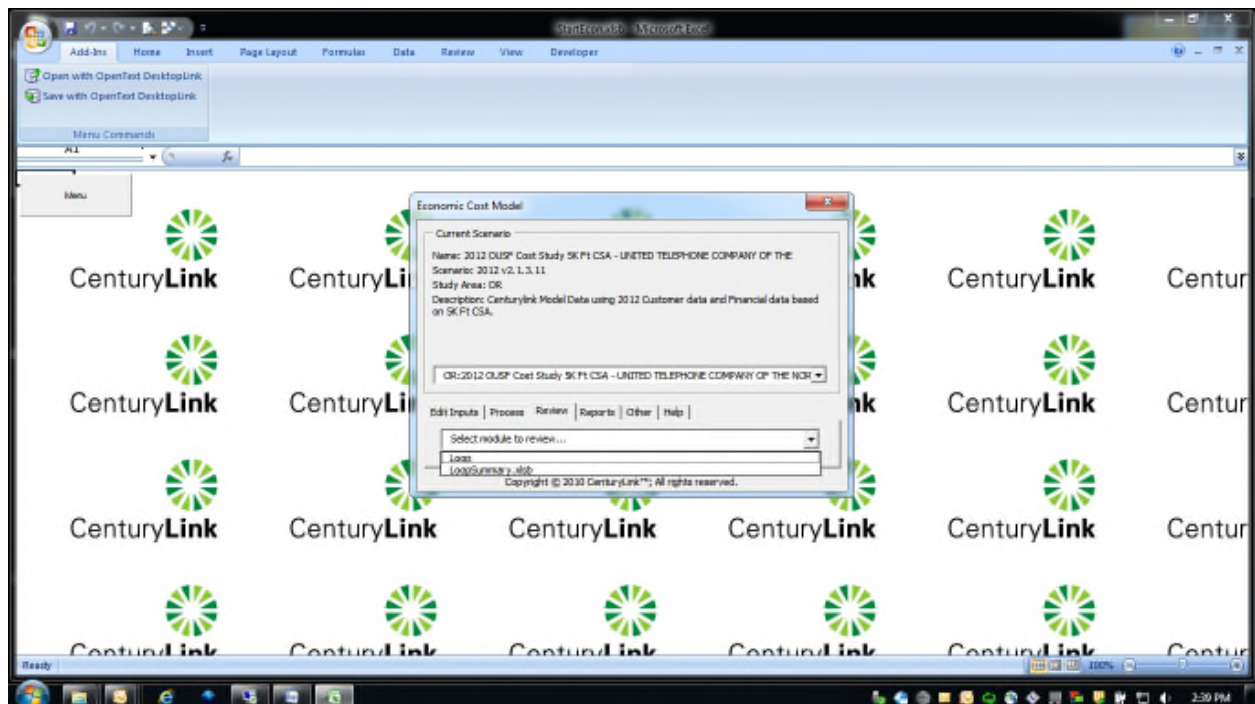
$$\begin{aligned}\text{Investment} \times \text{Annual Cost Factor} &= \text{Annual Recurring Cost} \\ \text{Annual Recurring Cost} / 12 &= \text{Monthly Recurring Cost}\end{aligned}$$

Processing consists of two steps:

- 1) Accumulate the investments across all modules. Investment accumulations are used to determine correct weighting of annual cost factors based on investments for each plant type.
- 2) Apply the cost factors to the individual network elements to derive monthly recurring costs.

Results

Once the ECM completes processing the application of the cost factors to determine monthly recurring costs, the summary results of the investment calculations and cost factor application are saved and may be viewed via the ECM user interface by selecting the scenario and results to review.



Results may also be viewed directly via the individual result files for each scenario.